What is claimed is:

1. A focus search method comprising:

generating a sine wave in response to a focus search command; and

performing a focus search using an optical pickup in response to the sine wave.

2. The focus search method of claim 1, wherein a frequency and/or an amplitude of the sine wave varies.

3. The focus search method of claim 1, wherein after successfully performing the focus search, the optical pickup performs a focus servo.

4. A focus search method comprising:

generating a sine wave; and

performing a focus search using an optical pickup that ascends or descends toward or from an optical disc in response to an amplitude of the sine wave.

5. The focus search method of claim 4, wherein a frequency and/or an amplitude of the sine wave varies.

6. The focus search method of claim 4, further comprising starting a focus servo after a focus-on point using the optical pickup.

7. A focus search method comprising:

performing a focus search using an optical pickup that ascends or descends toward or from an optical disc in response to an amplitude of a sine wave generated by a sine wave generator; and

after successfully performing the focus search, performing a focus servo using the optical pickup.

8. The focus search method of claim 7, wherein a frequency and/or an amplitude of the sine wave varies.

9. A focus search apparatus comprising:

a sine wave generator that generates a sine wave;

a switch that selectively outputs one of a signal output from the sine wave generator and a filtered focus error signal in response to a control signal; and

a driver that drives an optical pickup in response to a signal output from the switch.

10. The focus search apparatus of claim 9, wherein if a focus search is performed, the optical pickup is driven in response to an amplitude of the sine wave, and if a focus servo is performed, the optical pickup is driven in response to the filtered focus error signal.

11. A focus search apparatus comprising:

a sine wave generator that generates a sine wave;

a focus loop filter that receives and filters a focus error signal, and outputs the filtered focus error signal;

a focus-on condition detector that receives a focus OK signal and the focus error signal, detects focus-on conditions, and outputs a control signal corresponding to the detection result;

a switch that selectively outputs one of a signal output from the sine wave generator and a signal output from the focus loop filter in response to the control signal; and

a driver that drives an optical pickup in response to a signal output from the switch.

12. The focus search apparatus of claim 11, wherein if a focus search is performed, the optical pickup is driven in response to an amplitude of the sine wave, and if a focus servo is performed, the optical pickup is driven in response to the filtered focus error signal.

13. A focus search method comprising:

receiving a plurality of command signals and detecting focus-on conditions; and

if the focus-on conditions are not satisfied, performing a focus search using an optical pickup in response to a sine wave generated by a sine wave generator, and if the focus-on conditions are satisfied, performing a focus servo using the optical pickup in response to at least one of the plurality of command signals.

14. The focus search method of claim 13, wherein the plurality of command signals comprise a focus error signal and a focus OK signal.

15. A focus search method comprising:

receiving, low-pass filtering, and outputting a signal output from a focus loop filter during a focus-on; and

adding a waveform for a focus search and the low-pass filtered signal during the focus search,

wherein the focus search starts from the low-pass filtered signal.

16. The focus search method of claim 15, wherein the low-pass filtered signal is held during the focus search.

17. The focus search method of claim 15, wherein the focus search method is used even when a defective signal or an anti-shock signal is generated.

18. The focus search method of claim 15, wherein during the focus search, the range of the waveform for the focus search increases in proportion to the number of times the focus search is performed.

19. A focus search method comprising:

driving an optical pickup in response to a signal output from a focus loop filter during a focus-on; and if a focus drop occurs after the focus-on and a focus search is performed again, performing the focus search from the signal output from the focus loop filter during the focus-on before the focus drop occurs using the optical pickup.

20. A focus search method comprising:

calculating an average value for the signal output from a focus loop filter during a focus-on;

if a focus drop occurs after the focus-on and a focus search is performed again, generating a waveform for the focus search and adding the waveform for the focus search and the average value; and

performing the focus search within a predetermined focus search range based on the average value.

21. A focus search waveform generator comprising:

a filter that receives and low-pass filters an input signal, and outputs the low-pass filtered signal;

a sine wave generator that generates a sine wave during a focus search;

a counter that is connected to the sine wave generator, receives the sine wave, counts points at which a sign of the sine wave changes, and outputs the counted result;

an amplifier that is connected to the sine wave generator, receives the sine wave, and controls an amplitude of the sine wave in response to a signal output from the counter; and

an adder that receives and adds the low-pass filtered signal output from the filter and a signal output from the amplifier, and outputs the addition result.

22. The focus search waveform generator of claim 21, wherein the low-pass filtered signal output from the filter is held during the focus search.

23. A focus search waveform generator comprising:

a filter that receives and filters an input signal, and outputs the low-pass filtered signal;

a level adjustor that outputs a predetermined level adjustment value;

a subtractor that receives the low-pass filtered signal output from the filter and the level adjustment value and subtracts the level adjustment value from the low-pass filtered signal output from the filter;

an adder that receives and adds the low-pass filtered signal output from the filter and the level adjustment value;

a first amplifier that is connected to the subtractor and controls a gain of a signal output from the subtractor in response to a count signal;

a second amplifier that is connected to the adder and controls a gain of a signal output from the adder in response to the count signal;

a level range storage that receives and stores signals output from the first and second amplifiers;

a waveform generator that generates a triangle wave swinging within a range of a signal output from the level range storage; and

a counter that receives and compares a signal output from the waveform generator and the signal output from the level range storage, and outputs the count signal corresponding to the comparison result,

wherein the signal output from the waveform generator starts from the low-pass filtered signal output from the filter.

24. A focus search method comprising:

receiving a focus OK signal and determining a logic state of the focus OK signal; and

generating waveforms for a focus search having different slopes based on the determination result.

25. A focus search method comprising:

receiving a focus OK signal; and

if the focus OK signal is logic “low”, generating a waveform for the focus search having a first slope, and if the focus OK signal is logic “high”, generating a waveform having a second slope.

26. The focus search method of claim 25, wherein the first slope is greater than the second slope.

27. A controller for controlling a loop gain of a servo system, the controller comprising:

a sine wave generator that generates a sine wave;

a first adder that receives and adds an error signal and the sine wave, and outputs the addition result;

a loop filter that receives a signal output from the first adder, controls a gain of the signal output from the first adder, and outputs a signal, a gain of which is controlled;

a second adder that receives and adds the error signal and the signal output from the first adder, and outputs the addition result;

a filter that receives and filters a signal output from the second adder; and

a phase difference detector that receives the sine wave and a signal output from the filter, compares a phase difference between the sine wave and the signal output from the filter with a reference phase, and outputs a gain control signal corresponding to the comparison result,

wherein the gain of the loop filter is controlled in response to the gain control signal.

28. The controller of claim 27, wherein the reference phase is 90 degrees.

29. The controller of claim 27, wherein the error signal corresponds to the signal output from the loop filter.

30. The controller of claim 27, wherein the error signal is the signal output from the loop filter that is fed back to the loop filter via an optical pickup.

31. The controller of claim 27, wherein the loop filter is a low-pass filter.

32. The controller of claim 27, wherein the filter is a band-pass filter.

33. The controller of claim 27, wherein if the phase difference is greater than the reference phase, the gain of the loop filter decreases in response to the gain control signal, and if the phase difference is less than the reference phase, the gain of the loop filter increases in response to the gain control signal.

34. The controller of claim 27, wherein the sine wave generator comprises:

a first multiplier having a first factor;

a second multiplier having a second factor;

a first adder that receives and adds a signal output from the first multiplier and a signal output from the second multiplier;

a second adder that receives and adds a control signal and a signal output from the first adder;

a first delay unit that is connected between an output node of the second adder and an input node of the first multiplier, receives a signal output from the second adder, and delays the signal output from the second adder for a predetermined period of time;

a second delay unit that is connected between the input node of the first multiplier and an input node of the second multiplier, receives an input signal of the first multiplier, and delays the input signal of the first multiplier for a predetermined period of time; and

a third multiplier that has a third factor, receives the signal output from the second adder, and outputs the sine wave.

35. A sine wave generator for generating a sine wave to control a loop gain of a servo system, the sine wave generator comprising:

a first multiplier having a first factor;

a second multiplier having a second factor;

a first adder that receives and adds a signal output from the first multiplier and a signal output from the second multiplier;

a second adder that receives and adds a control signal and a signal output from the first adder;

a first delay unit that is connected between an output node of the second adder and an input node of the first multiplier, receives a signal output from the second adder, and delays the signal output from the second adder for a predetermined period of time;

a second delay unit that is connected between the input node of the first multiplier and an input node of the second multiplier, receives an input signal of the first multiplier, and delays the input signal of the first multiplier for a predetermined period of time; and

a third multiplier that has a third factor, receives the signal output from the second adder, and outputs the sine wave.

36. The sine wave generator of claim 35, wherein the control signal is an impulse signal.

37. The sine wave generator of claim 35, wherein a frequency of the sine wave is controlled in response to the first factor.

38. The sine wave generator of claim 35, wherein an amplitude of the sine wave is controlled in response to the third factor.

39. The sine wave generator of claim 35, wherein the first and second delay units are D flip-flops.

40. The sine wave generator of claim 35, wherein the first and second delay units are resettable.

41. A method of controlling a gain of a servo system, the method comprising:

receiving and adding an error signal and a sine wave output from a sine wave generator, and outputting the addition result as a first signal;

receiving the first signal, controlling a gain of the first signal, and outputting a signal, a gain of which is controlled;

receiving and adding the error signal and the first signal, and outputting the addition result as a second signal;

receiving and filtering the second signal, and outputting the filtered result as a third signal; and

receiving the sine wave and the third signal, comparing a phase difference between the sine wave and the third signal with a reference phase, and outputting the comparison result as a gain control signal,

wherein the gain of the first signal is controlled in response to the gain control signal.

42. The method of claim 41, wherein the reference phase is 90 degrees.

43. The method of claim 41, wherein the error signal corresponds to the second signal, the gain of which is controlled.

44. The method of claim 41, wherein the third signal is the second signal that is band-pass filtered.

45. The method of claim 41, wherein if the phase difference is greater than the reference phase, a gain of the first signal decreases in response to the gain control signal, and if the phase difference is less than the reference phase, the gain of the first signal increases in response to the gain control signal.